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## [12] 实用新型专利说明书

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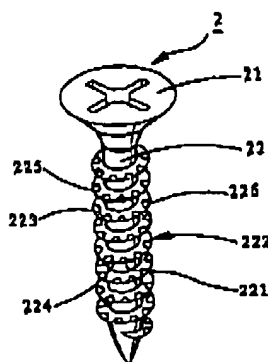
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[54] 实用新型名称 木螺丝

[57] 摘要

一种木螺丝，包含有螺头以及设于螺头上的杆体，该杆体上环设有螺旋状的螺牙，该螺牙具有一由周缘面向上延伸的上、下切削面，该上、下切削面相接形成牙峰，在该螺牙的上切削面、下切削面或上、下切削面上开设有间隔设置复数个凹槽，使牙峰形成锯齿状，其具有较佳剪切与增加排屑空间等效果，还有利于锁合时达到锁合迅速、省力等功效，并且凹槽的开设将增加木纤维屑的容置，可以增进锁合的紧固力。



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## 权 利 要 求 书

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- 1、一种木螺丝，其主要包含有螺头以及设于螺头上的杆体；该杆体的周缘面上环设有螺旋状的螺牙，该螺牙具有一由周缘面向上延伸的上、下切削面，该上、下切削面相接形成一牙峰，其特征在在于：  
5 该螺牙的切削面上开设有间隔设置的一组凹槽，而每一凹槽延伸至牙峰处，使牙峰形成锯齿状。
- 2、如权利要求1所述的木螺丝，其特征在在于：该凹槽开设于上切削面。
- 10 3、如权利要求1所述的木螺丝，其特征在在于：该凹槽开设于下切削面。
- 4、如权利要求1所述的木螺丝，其特征在在于：该每一螺牙的上、下切削面上均开设有间隔设置的一组凹槽，且上、切削面上的凹槽交错设置，使牙峰形成锯齿状。

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## 说明书

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## 木螺丝

## 技术领域

5

本实用新型涉及一种木螺丝。

## 背景技术

10 如图1、图2所示，一般木螺丝1主要适用在锁合于纤维性对象14上，该木螺丝1包含螺头11以及与该螺头11连

15 结的杆体12；其中，该杆体12的周缘面121上环设有螺旋状的螺牙13，而该螺牙13具有一由周缘面121向上延伸的上、下切削面131、132，同时该上、下切削面131、132相接形成一牙峰133，另于该牙峰133上开

20 设有多个牙刀15；故在锁合时，施工者可施予该螺头11一旋转扭力，以连动杆体12同步转动，再借助螺牙13及牙刀15切削纤维性对象14的木纤维屑，从而可使杆体12逐渐螺入纤维性对象14中，同时被切削产生的木纤维屑则会积存于该等螺牙13所形成的间隙中，以达到锁合及定位的功效。

20 该木螺丝1虽具有锁合及定位的功效，不过使用上却仍有改善之处，兹详述如下：

## 1. 制造困难：

25 由于该等牙刀15呈密集性开设，除制造过程外，就连木螺丝1制造后的承接、运送等阶段都必须注意，方能确保牙刀15搓牙成型后可以呈尖锐状的凸出，否则会影响木螺丝1的锁合效果，无形之中将会增加木螺丝1制造的困难度。

## 2. 锁合费力且效果差：

30 由于木纤维对象14由多数木纤维交错而成，故其特性具有弹性，因此，螺牙13上的牙刀15在锁入过程中，易因木纤维弹性因素而无法有效达到剪切效果，造成只是将木纤维撑开进入而已；相反地，木纤维极易缠绕于杆体12上，导致在锁合过程中，施工者需施予较大的旋入扭力，方能让杆体12顺利螺合入纤维性对象14中，造成施工不便。

35 再者，牙刀15开设，若在锁合过程中无法顺利地将木纤维切断，导致牙刀15将会承受更大的锁合扭矩，除锁合速度受影响，还极易造成牙刀15产生毁损断裂的现象，影响牙刀15的切削效果，造成锁合过程更费力，实有待改善。

## 3. 锁合的紧固力降低：

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因锁合扭矩过大,造成牙刀 15 产生毁损断裂现象,致使螺牙 13 实际外径缩减,影响所及的是螺牙与螺牙之间可容置木纤维屑的体积缩小,造成螺丝锁合的紧固力降低,使锁合后的螺丝易产生松动。

## 5 实用新型内容

本实用新型的目的在于提供一种木螺丝,其制造简单、锁合省力且锁合后的紧固力大。

为实现上述目的,本实用新型的技术解决方案是:一种木螺丝,其主要包含有螺头以及设于螺头上的杆体;该杆体的周缘面上环设有螺旋状的螺牙,该螺牙具有一由周缘面向上延伸的上、下切削面,该上、下切削面相接形成一牙峰;该螺牙的切削面上开设有间隔设置的一组凹槽,而每一凹槽延伸至牙峰处,使牙峰形成锯齿状。

该凹槽开设于上切削面或下切削面。

该每一螺牙的上、下切削面上均开设有间隔设置的一组凹槽,且上、下切削面上的凹槽交错设置,使牙峰形成锯齿状。

采用上述方案后,由于本实用新型在螺牙的上切削面、下切削面或上、下切削面上开设有间隔设置的凹槽,使牙峰形成锯齿状,因此该木螺丝下列优点与功效:

### 1. 制造简单:

由于本实用新型并没有习用牙刀的设计,而只是在螺牙的上切削面、下切削面或上、下切削面上开设有间隔设置的复数个凹槽,其均可一体搓牙成型,再加上牙峰的成型,已为业界成熟的技术,故制造成型上较为简单。

### 2. 锁合省力且效果佳:

由于凹槽的开设,使牙峰形成锯齿状,因此在螺牙锁入过程中,将有利于对木纤维产生持续的锯切效果,以降低锁合阻力,从而使木螺丝快速锁合进入木纤维对象中,增加施工方便性。

### 3. 提升锁合的紧固力:

由于螺牙可有效、持续地锯切木纤维,所以锁合扭矩可以降低,同时螺牙牙峰呈完整螺旋状,故锁合过程中不会造成螺牙毁损断裂的现象,致使螺牙实际外径可以较一般木螺丝大,相对地螺牙与螺牙之间可容置木纤维屑的体积增加,将有助提升螺丝锁合的紧固力,使锁合后的螺丝不易产生松动。

设计,特别是一种使用上具有锁合迅捷、省力及锁合的紧固力的木螺丝

因此,本实用新型的旨在提供一种钻孔机的防尘套,其具有锁合迅捷、省力及增进锁合的紧固力等功效。

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本实用新型木螺丝，适用于锁设在纤维性对象中，其包含有一螺头、以及一设于螺头上之杆体；其中，该杆体的周缘面上环设有螺旋状的螺牙，且该螺牙具有一由周缘面向上延伸之上、下切削面，同时该上、下切削面相接形成一牙峰，特别是，该螺牙之上切削面、下切削面或上、下切削面上开设有间隔设置之复数凹槽等态样，且该每一凹槽并延伸至牙峰处，以使牙峰形成锯齿状，除具有较佳剪切与增加排屑空间等效果，将利于锁合时达到锁合迅捷、省力等功效外，并且凹槽之开设将增加木纤维屑之容置，得以增进锁合的紧固力。

#### 10 附图说明

- 图 1 是习用木螺丝的立体示意图；  
图 2 是习用木螺丝的锁合状态示意图；  
图 3 是本实用新型的立体示意图；  
15 图 4 是本实用新型的使用状态示意图；  
图 5 是本实用新型第二实施例的立体示意图；  
图 6 是本实用新型第三实施例的侧视示意图。

#### 具体实施方式

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如图 3 所示，本实用新型所述的木螺丝 2 同样包含有螺头 21 及杆体 22；其中，该杆体 22 一端与螺头 21 相連結，且该杆体 22 的周缘面 221 上环设有螺旋状的螺牙 222，该螺牙 222 具有一由周缘面 221 向上延伸的上、下切削面 223、224，同时该上、下切削面 223、224 相接形成一牙峰 225；本实用新型所不同的是，该螺牙 222 的上切削面 223 上开设有间隔设置的复数个凹槽 226，且每个凹槽 226 均延伸至牙峰 225 处，从而使螺旋环绕的牙峰 225 形成高低起伏的锯齿状。

同时再配合图 4 所示，该木螺丝 2 在进行锁合作业时，施工者可先将木螺丝 2 抵触于待锁合的纤维性对象 3 上，并在螺头 21 上持续地施予一旋转扭力，其同步连动螺牙 222 转动，以便能逐渐攻入纤维性对象 3 中，除了螺牙 222 的牙峰 225 维持完整锐利的切削效果外，再配合螺牙 222 上切削面 223 形成的凹槽 226，可以使螺旋环绕的牙峰 225 形成高低起伏的锯齿状；这将有助于锁合过程中对木纤维产生的锯切效果，从而降低锁合阻力，而有利于木螺丝 2 快速锁合进入木纤维对象 3 中。

再者，由于凹槽 226 的开设设计，可使任意两螺牙 222 间的木纤维屑的容置体积增加，将有助于锁合切削过程产生的木纤维屑容置，以提供更好的排屑功能，减少锁合阻力，相对地降低螺牙 222 的锁合

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扭矩,并且该木纤维屑充填容置后,可以增进木螺丝2锁合的紧固力。

如图5所示,其为本实用新型的第二实施例,该木螺丝4仍包含有螺头41及杆体42等构件,且各构件的构造均与第一实施例相同,恕不详述;而本实施例木螺丝4的不同处在于:该螺牙43的下切削面431上开设有间隔设置的复数个凹槽432,而每一凹槽432均延伸至牙峰433处,从而使牙峰433形成锯齿状;该实施例同样具有较佳剪切与增加排屑空间等效果,并利于锁合时达到锁合迅捷、省力等功效,而且凹槽432的开设将增加木纤维屑的容置,可以增进锁合的紧固力。

如图6所示,其为本实用新型的第三实施例,该木螺丝5仍包含有螺头51及杆体52等构件,且该各构件的构造均与第一实施例相同,恕不详述;所不同的是,本实施例在每一螺牙53的上、下切削面531、532上间隔开设有复数个凹槽533,而上切削面531上的凹槽533与下切削面532上的凹槽533交错设置,从而使牙峰534形成锯齿状,而具有更强的剪切与增加排屑空间等效果,其将利于锁合时达到锁合迅捷、省力等功效,并且凹槽533的开设将增加木纤维屑的容置,从而增加锁合的紧固力。

综上所述,本实用新型借助在螺牙的上切削面、下切削面或上、下切削面上开设有间隔设置的复数个凹槽,使牙峰形成锯齿状,除具有较佳剪切与增加排屑空间等效果外,还有利于锁合时达到锁合迅捷、省力等功效,并且凹槽的开设将增加木纤维屑容置,可以增进锁合的紧固力。

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说明书附图

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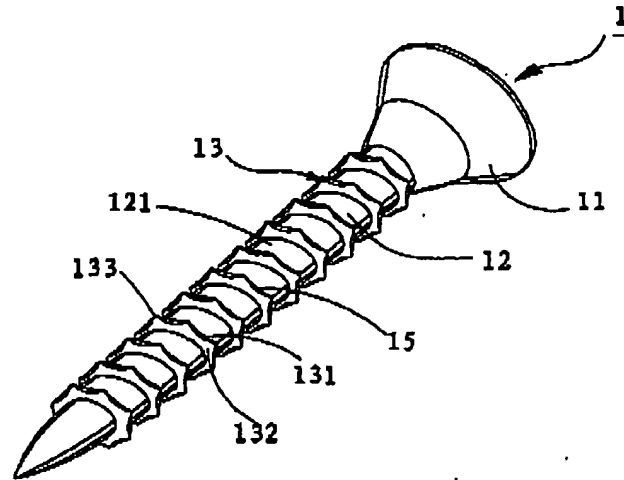


图1

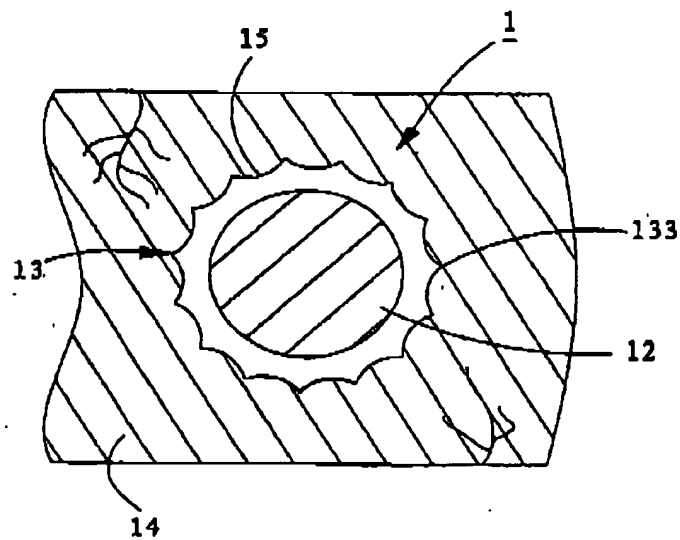


图2

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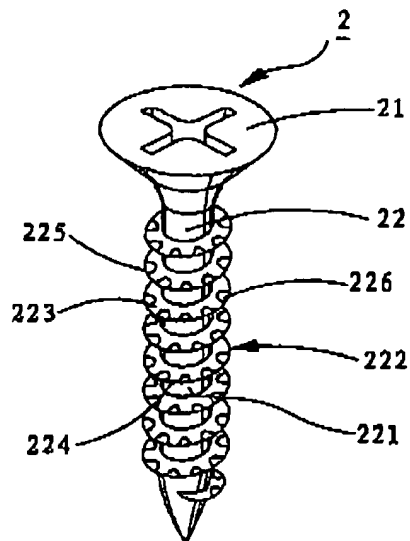


图 3

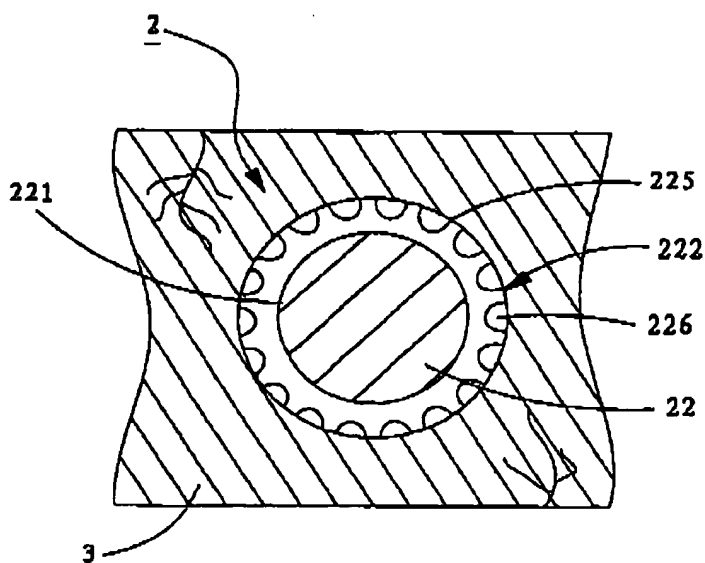


图 4



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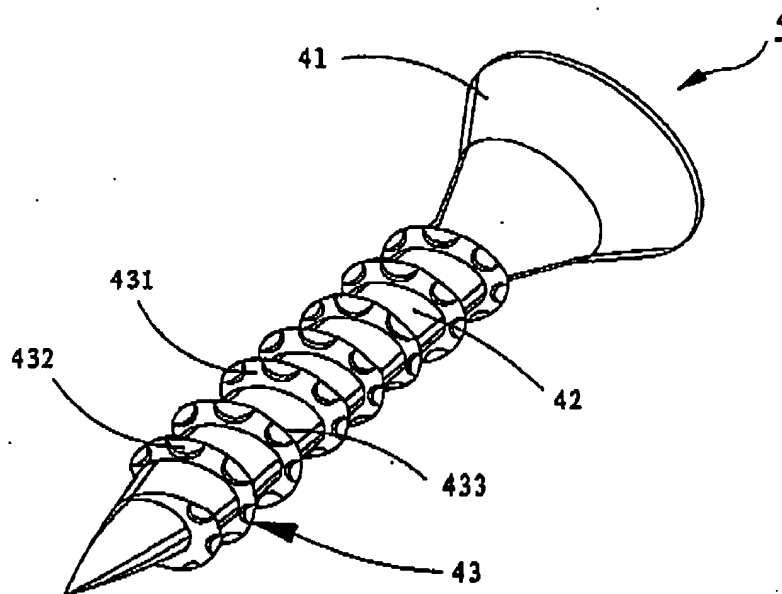


图 5

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说明书附图 第4/4页

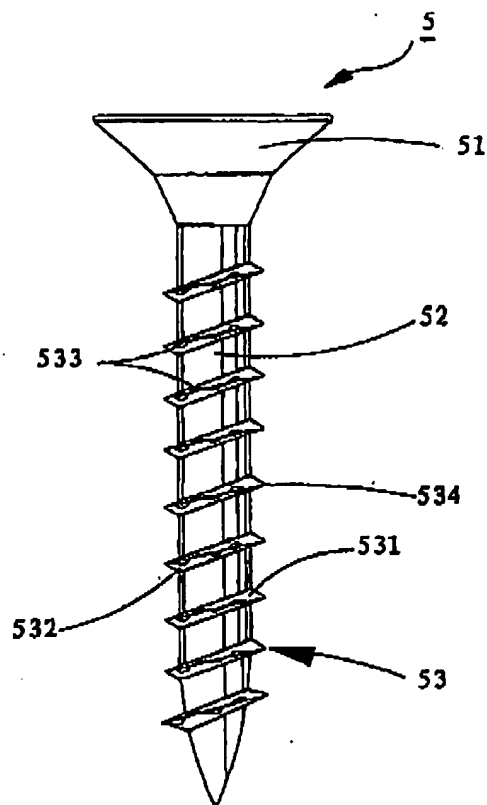


图 6

# **THE COVER PAGE OF THE CHINESE UTILITY MODEL PATENT SPECIFICATION**

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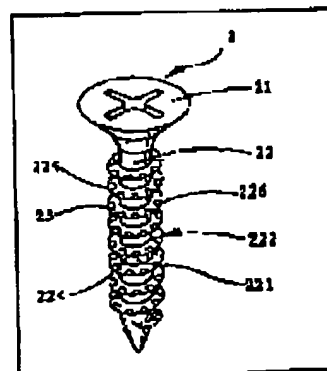
Drawing: Four pages

[72] Designer: Junxiong Chen

[54] Title of the utility model: Wood Screw

[57] Abstract

A wood screw comprises a screw head and a shank that is disposed on the screw head. Around the circumferential surface of the shank is disposed a helical thread having an upper and a lower cutting face both extending upward round the shank. A tooth-tip helical blade is formed at the joint portion of the upper and the lower cutting faces. A plurality of grooves is disposed on the upper cutting face and/or lower cutting face with each of the grooves extending to the tooth-tip helical blade to cause the tooth-tip helical blade being saw-tooth shaped. [The wood screw] has good effects on cutting and increasing space for disposing fibre swafs, and is advantageous for rapidly fastening up [the wood screw]. [The configuration of] grooves increases storage space to contain wood fibre swarfs, thus enhancing fastening force.



## CLAIMS

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1. A wood screw primarily including a screw head and a shank disposed on said screw head; a helical thread being disposed around the circumferential surface of the shank, the helical thread having an upper and a lower cutting face both extending upward around the shank, and a tooth-tip helical blade being formed at the joint section of the upper and the lower cutting faces; characterized in that:

a group of spaced grooves being formed on a said cutting face, each of the grooves extending to the tooth-tip helical blade to cause the tooth-tip helical blade being saw-tooth shaped.

2. The wood screw set forth in claim 1 is characterized in that: said grooves are disposed on said upper cutting face.

3. The wood screw set forth in claim 1 is characterized in that: said grooves are disposed on said lower cutting face.

4. The wood screw set forth in claim 1 is characterized in that: the group of spaced grooves is respectively disposed on both said upper cutting face and said lower cutting face; said group of spaced grooves is alternately disposed to cause the tooth-tip helical blade being saw-tooth shaped.

## **SPECIFICATION**

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### **A NEW WOOD SCREW**

#### **FIELD OF THE UTILITY MODEL**

The present utility model relates to a wood screw.

#### **BACKGROUND OF THE UTILITY MODEL**

As shown in Figures 1 and 2, a regular wood screw 1 is primarily suitable for fastening up it in a fibre article 14. The wood screw 1 comprises a screw head 11 and a shank 12 connected with the screw head 11, wherein around the circumferential surface 121 of the shank 12 is disposed a helical thread 13 having an upper cutting face 131 and a lower cutting face 132 both extending upward round the shank 121. In the meantime, at the joint portion of the upper and the lower cutting faces 131 and 132 is formed a tooth-tip helical blade 133 having a plurality of tooth-shaped cutters 15. Therefore, during fastening up the wood screw, a worker may apply a torsion torque to the screw head 11 so that the screw head 11 can be synchronously turned together with the shank 12. The tooth-shaped cutters 15 and the helical thread 13 cut off wood swarfs from the fibre article 14 to causing the shank 12 gradually to enter the fibre article 14. In the meantime, the wood swarfs generated from the cutting process are accumulated inside the gaps of the helical thread 13 to achieve the effect of fastening up and positioning.

Although the wood screw 1 has the effect of fastening up and positioning, some improvements can be made for its shortcomings in using, the details of which are described as follows:

#### **1. Difficult in manufacturing:**

Because the tooth-shaped cutters 15 are densely disposed, not only in manufacturing process, much attention has to be paid as well to ensure the projected edge of the tooth-shaped cutters 15 in sharp condition during the receiving in and shipping out process. If not, it would have a negative effect on fastening up of the wood screw 1, thus virtually increasing difficulty in manufacturing the wood screw 1.

## 2. Strenuous and Imperfect effect in fastening up

The fibre article 14 has elastic characteristic because it is composed of twined fibers. Therefore, when the tooth-shaped cutters 15 on the helical thread 13 is in entering process, it cannot cut off effectively because of the elasticity of the wood fibers, but can only push apart the wood fibers to enter [the wood fibers]. Negatively, the wood fibers might easily wrap around the shank 12 such that the worker needs to apply large torsion torque to rotate the shank 12 into the fibre article 14, which is quite inconvenient in operation.

Furthermore, when the tooth-shaped cutters 15 cannot smoothly cut off wood fibers in fastening up process, the tooth-shaped cutters 15 will bear lager torsion torque. [Such torsion torque] not only impacts fastening up speed, but also has tendency to break the tooth-shaped cutters 15, thus impacting cutting off effect of the tooth-shaped cutters 15 and requiring lager force in fastening up process. An improvement is in deed needed to eliminate this shortcoming.

## 3. Reduction in fastening force

Once the tooth-shaped cutters 15 break due to too large torsion torque, the actual outer diameter of the helical thread 13 will be reduced, so that the storage space to contain wood swarfs between two adjacent teeth of the helical thread also is reduced, which causes fastening force reduced, which in turn causes fastened wood screw easy to loose.

## SUMMARY OF THE UTILITY MODEL

The objective of the utility model is to provide a wood screw, which is simple in manufacturing, saving labor in fastening up process, and has a large fastening force after the wood screw is fastened up.

To achieve the objective, the technical solution of the utility model provides a wood screw primarily including a screw head and a shank disposed on the screw head. A helical thread is disposed around the circumferential surface of the shank; the helical thread has an upper cutting face and a lower cutting face both extending upward around the shank; and a tooth-tip helical blade is formed at the joint portion of the upper and the

upper and the lower cutting faces; a group of spaced grooves are formed on the upper cutting face and/or the lower cutting face each of the grooves extends to the tooth-tip helical blade to cause it being saw-tooth shaped.

The grooves are disposed on the upper or lower cutting faces.

A group of spaced grooves are respectively disposed on both the upper cutting faces and the lower cutting faces; and the group of spaced grooves is alternately-disposed to cause the tooth-tip helical blade being saw-tooth shaped.

By using the foregoing technical solution, the upper cutting face and/or a lower cutting face has spaced grooves causing the tooth-tip helical blade being saw-tooth shaped. The wood screw has following advantages and results:

1. Simple in fabrication

[The wood screw] may be simply manufactured because the present utility model does not use the design of tooth-shaped cutters. Instead, it forms a plurality of spaced grooves on the lower cutting face and/or the upper cutting faces of the helical thread. The formation of the tooth-tip helical blade is a mature technique in the industry.

2. Labor saving and perfect effect in fastening up

Because the grooves cause the tooth-tip helical blade being saw-tooth shaped, it facilitates the effect of continuously saw-cutting to wood fibers when the helical thread is in fastening up process. This reduces resistance in fastening up process, thus causing the wood screw rapidly entering into a wood fibre article and increasing convenience in operation.

3. Enhancing fastening force after the wood screw is fastened up

Because helical thread can continuously cut off the wood fibers, torsion torque can be reduced. In addition, because the tooth-tip helical blade of the helical thread is formed as one circulated shape, the helical thread will not be broken in fastening up process so that the actual outer diameter of the thread can be larger than that of an ordinary wood screw. This increases spaces to store wood swarfs between two adjacent helical threads, thus enhancing fastening force such that the wood screw will not be loosened easily when it is fastened up.

To design, a wood screw having efficacy of fastening up rapidly, labor saving and high

fastening force in using

Thus, the objective of the utility model is to provide a dust-proof casing for drilling machine, which has effect of rapid fastening up, labor saving, enhancing fastening force and etc.

The wood screw of the utility model, which is suitable for fastening up in fibre articles, comprises a screw head and a shank that is connected with the screw head. Around the circumferential surface of the shank is disposed helical thread having an upper cutting face and a lower cutting face and a tooth-tip helical blade is formed at the joint section of the upper cutting face and the lower cutting face. A plurality of spaced grooves is disposed on the upper cutting face and the lower cutting face with each of said grooves extending to the tooth-tip helical blade to cause the tooth-tip helical blade being saw-tooth shaped. In addition to having better effects on cutting and increasing space for disposing fibre swarfs, [the present utility model] has advantage of rapidly fastening up [the wood screw] and saving labor in fastening up process. The configuration of grooves can increase storage space to contain wood fibre swarfs, thus enhancing fastening force after [the wood screw] is fastened up.

#### **BRIEF DESCRIPTION OF DRAWINGS**

Figure 1 is a schematic perspective view of a traditional wood screw;

Figure 2 is a schematic sectional view of a traditional wood screw in fastening up state;

Figure 3 is a schematic perspective view of a wood screw according to the utility model;

Figure 4 is a schematic sectional view a wood screw according to the utility model in using state;

Figure 5 is a schematic perspective view of a second embodiment of the wood screw according to the utility model; and

Figure 6 is a schematic side view of a third embodiment of the wood screw according to the utility model.



### DETAIL DESCRIPTION OF EMBODIMENTS

As shown in Figure 3, the wood screw 2 according to the utility model similarly comprises a screw head 21 and a shank 22 with one end of shank 22 being connected with the screw head 21. Around a circumferential surface 221 of shank 22 is disposed a helical thread 222 having an upper cutting face 223 and a lower cutting face 224 both extending upward around the circumferential surface 221. The joint portion of the upper cutting face 223 and the lower cutting face 224 forms a tooth-tip helical blade 225. The distinctive aspect in the present utility model is that: there is a plurality of spaced grooves 226 disposed on the upper cutting face 223 on the helical thread 222. The grooves 226 extend to the tooth-tip helical blade 225, thus causing the tooth-tip helical blade 225 to be up-and-down saw-tooth shaped.

In the meantime, in accompanying with what is shown in Figure 4, in operation for fastening up the wood screw 2, a worker may first take the wood screw 2 and press its tip tightly against the surface of the fibre article 3. And the worker may then continuously apply a torsion torque to turn screw head 21, which synchronously turns the helical thread 222 to gradually, rotationally enter the fibre article 3. In addition to that the tooth-tip helical blade 225 of helical thread 222 has full and sharp cutting effect, the grooves 226 on the upper cutting face 223 of the helical thread 222 enables the tooth-tip helical blade 225 to form a saw-tooth shape, which generates saw-cutting effect to wood fibers in fastening-up process, to reduce fastening-up resistance thus being advantageous for the wood screw 2 to rapidly enter the wood fibre article 3.

In addition, the design of the grooves 226 can increase the storage space to contain wood fibre swarfs between any two adjacent helical threads 222; thus being advantageous to dispose wood fibre swarfs in the cutting process, to reduce resistance for fastening-up and to decrease torsion torque to helical thread 222. Furthermore, because the above-mentioned storage space is filled with the wood fibre swarfs, the fastening force of the wood screw 2 is enhanced.

Referring to Figure 5, there is shown a wood screw 4 according to a second embodiment of the present utility model, which comprises a screw head 41, a shank 42 and other structural components that are the same with these in the first embodiment and

will not be described in detail. The distinctive aspect of the wood screw 4 of the present utility model is that: there is a plurality of the spaced grooves 432 on the lower cutting face 431 of helical thread 43 with each of grooves 432 extending to the tooth-tip helical blade 433 such that the tooth-tip helical blade 433 is formed being up-and-down saw-tooth shaped. Similarly, this embodiment has good effects on cutting and increasing space for disposing fibre swarfs. [This embodiment] is advantageous for rapidly fastening up [the wood screw] and saving labor in fastening up process. The configuration of grooves 432 can increase storage space to contain wood fibre swarfs, thud enhancing fastening force after [the wood screw 4] is fastened up.

Referring to Figure 6, there is shown a wood screw 5 according to a third embodiment of the present utility model, which comprises a screw head 51, a shank 52 and other structural components that are same with these in the first embodiment and will not be described in detail. The distinctive aspect of this embodiment is that: there is a plurality of the spaced grooves 533 on the lower cutting face 531 and the upper cutting face 532 of the helical thread 53. The grooves 533 on the upper cutting face 531 and the grooves 533 on the lower cutting face 531 are alternately disposed so that tooth-tip helical blade 534 is formed being saw-tooth shaped. Similarly, this embodiment has better effects on cutting and increasing space for disposing fibre swarfs. [This embodiment] is advantageous for rapidly fastening up [the wood screw] and saving labor in fastening up process. The configuration of grooves 533 can increase storage space to contain wood fibre swarfs, thud enhancing fastening force after [the wood screw 5] is fastened up.

In view of the foregoing, the present utility model disposes a plurality of grooves on the lower cutting face and/or upper cutting face of a helical thread to form tooth-tip helical blade as saw-tooth shape. In addition to having better effect of cutting [off wood fibers] and increasing storage space for disposing wood fibers, [the present utility model] is advantageous for rapidly fastening up [the wood screw] and saving labor in fastening up process. The configuration of grooves can increase storage space to contain wood fibre swarfs, thud enhancing fastening force after [the wood screw] is fastened up.

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说明书附图

第1/4页

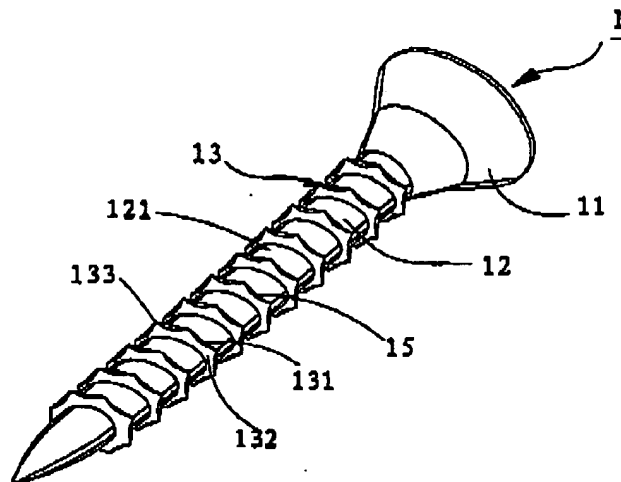


图1 (Fig. 1)

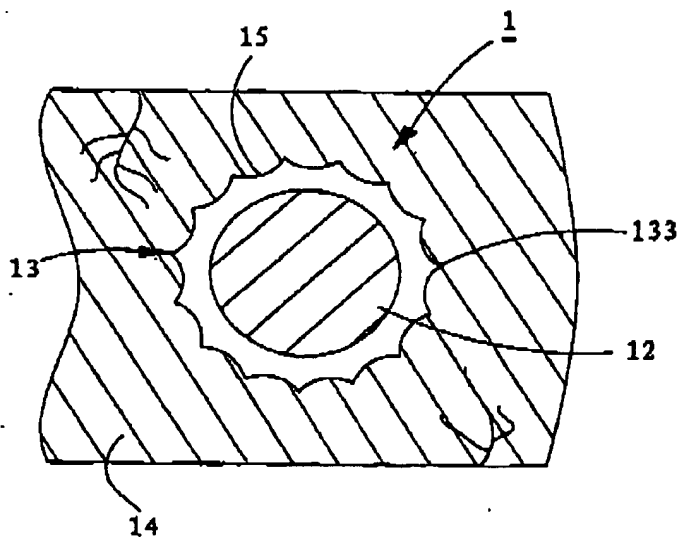


图2 (Fig. 2)

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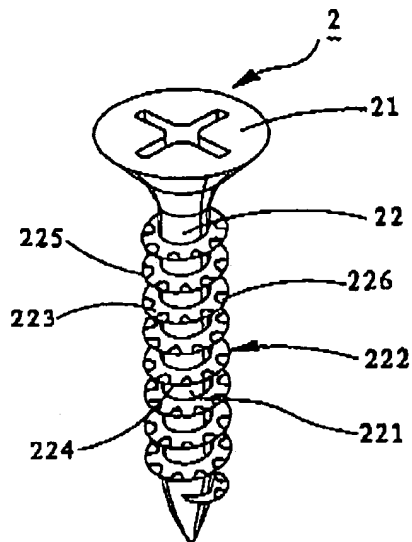


图3 (Fig. 3)

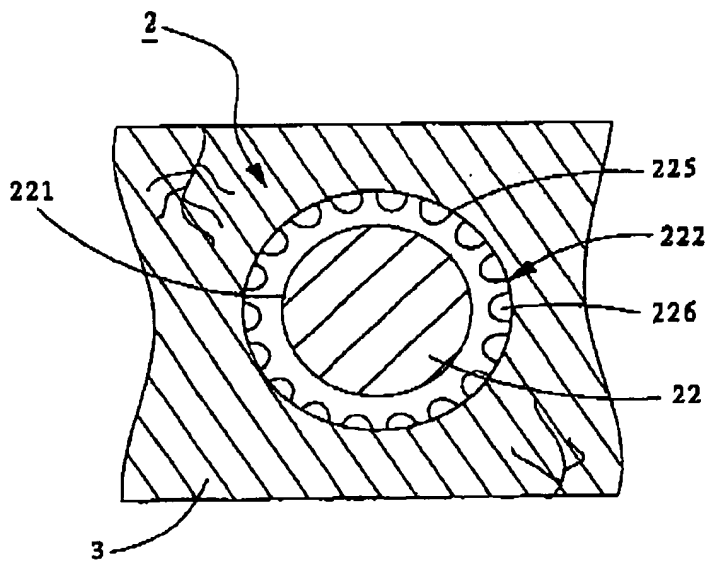


图4 (Fig. 4)

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说明书附图 第3/4页

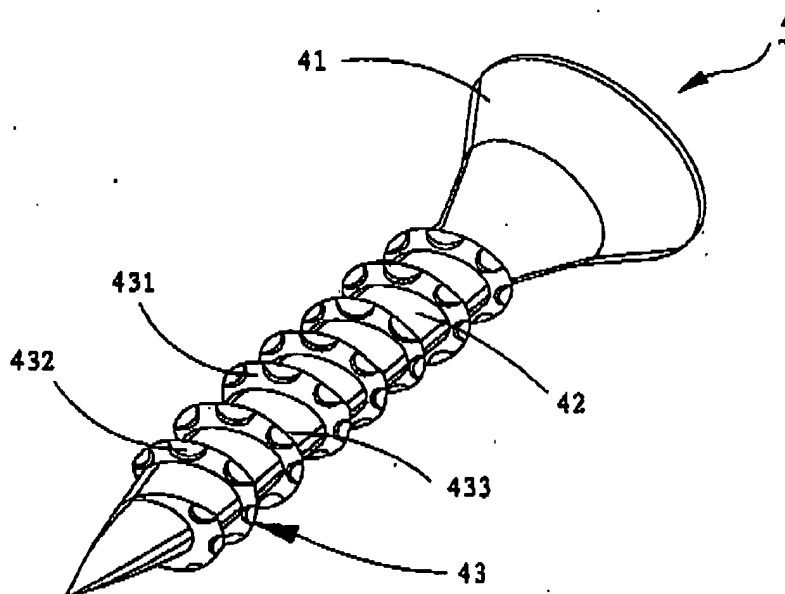


图5 (T. 5)

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说明书附图 第4/4页

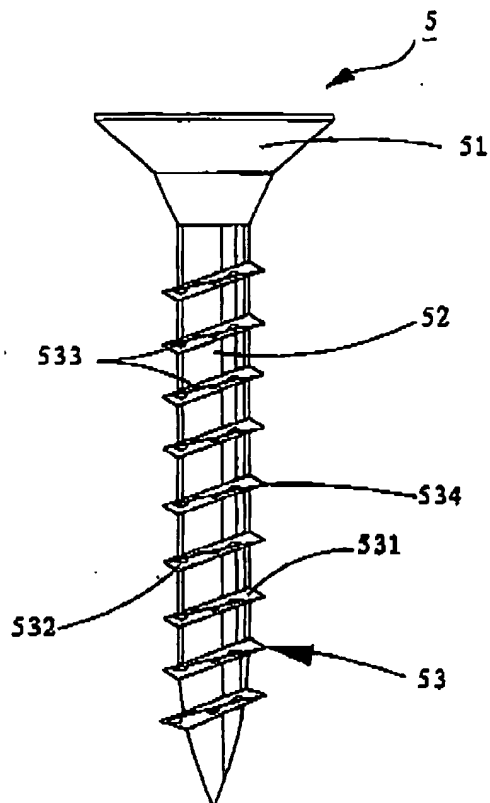


图6 (Fig. 6)

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